

CLAIMS

What is claimed is:

1. An organic electronic device, comprising:

5 a deposition surface;

a first organic layer, said organic layer fabricated by selectively depositing a first organic solution over said deposition surface, further wherein said first organic solution is cross-linked to render said first organic layer insoluble;

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a second organic layer, said second organic layer fabricated by selectively depositing a second organic solution over said cross-linked first organic layer and enabling said second organic solution to dry without dissolving said first organic layer.

2. A device according to claim 1 further comprising: a third organic layer fabricated by cross-linking said second organic layer and selectively depositing a third organic solution upon said cross-linked second organic layer.

3. A device according to claim 1 wherein said cross-linking is performed by applying ultraviolet radiation to said device.

4. A device according to claim 1 wherein said first organic solution blends cross-linking groups for a base organic solution before said first organic solution is cross-linked.

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5. A device according to claim 1 wherein said first organic solution includes an initiating agent to assist in the cross-linking process.

10 6. A device according to claim 1 wherein said cross-linking is achieved thermally.

7. A device according to claim 1 wherein said cross-linking is controlled to achieve a certain thickness for said
15 cross-linked first organic layer.

8. A device according to claim 2 wherein said cross-linking is performed by applying ultraviolet radiation to said device.

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9. A device according to claim 2 wherein said second organic solution blends cross-linking side-groups for a base organic solution before said second organic solution is cross-linked.

10. A device according to claim 2 wherein said second organic solution includes an initiating agent to assist in the cross-linking process.

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11. A device according to claim 2 wherein said cross-linking is achieved thermally.

12. A device according to claim 1 wherein said cross-linking is controlled to achieve a certain thickness for said cross-linked second organic layer.

13. A device according to claim 1 wherein said first organic layer is a conducting polymer layer.

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14. A device according to claim 1 wherein said organic electronic device is a OLED device.

15. A device according to claim 14 wherein said deposition surface is the lower electrode layer.

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16. A device according to claim 15 wherein said second organic layer is an emissive layer, said emissive layer emitting light upon charge recombination.

17. A device according to claim 16 further comprising a cathode layer disposed over said emissive layer.

5 18. A device according to claim 13 wherein said conducting polymer layer is fabricated from a modified PEDOT:PSS solution.

19. A device according to claim 1 wherein said device behaves as an organic transistor.

10 20. A device according to claim 1 wherein said device behaves as an opto-electronic device.

21. A method of fabricating an organic electronic device,
15 said device including a top exposed deposition surface, the method comprising:

depositing a first organic solution selectively on said exposed deposition surface, said deposited first organic solution capable of drying into a first organic layer;

20 cross-linking said first organic solution such that said first organic layer becomes insoluble; and

depositing a second organic solution selectively on said cross-linked first organic layer, said deposited second solution capable of drying into a second organic layer.

22. A method according to claim 21 wherein said second organic layer is formed by drying said deposited second organic solution.

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23. A method according to claim 21 further comprising:
cross-linking said second organic solution such that said second organic layer becomes insoluble.

10 24. A method according to claim 23 further comprising:
depositing a third organic solution selectively into said pockets on said cross-linked second organic layer.

15 25. A method according to claim 21 wherein said first organic solution includes cross-linking side groups.

26. A method according to claim 21 wherein said first organic solution includes at least one of a cross-linking and initiating agent.

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27. A method according to claim 21 wherein said organic electronic device is an organic light emitting diode (OLED) display.

28. A method according to claim 27 wherein said exposed deposition surface includes an anode.

29. A method according to claim 27 wherein said first
5 organic layer is a conducting polymer layer.

30. A method according to claim 28 wherein said second organic layer is an emissive layer, said emissive layer emitting light upon charge recombination.

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31. A method according to claim 29 wherein said first organic solution includes a modified PEDOT:PSS solution.

32. A method according to claim 21 wherein said device is
15 an organic transistor.

33. A method according to claim 21 wherein said device is an organic opto-electronic device.

20 34. A method according to claim 21 wherein the steps of cross-linking previously deposited organic solutions and depositing another organic solution on the previously cross-linked organic layers is repeated for every organic layer that is to be fabricated.

35. A method according to claim 21 wherein said cross-linking is by application of ultraviolet radiation to said device.

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36. A method according to claim 21 wherein said cross-linking is by application of thermal radiation to said device.

37. A method according to claim 23 further comprising:
10 masking said cross-linked second organic layer to block the application of radiation in those regions where said second organic solution had been deposited;

 depositing a third organic solution selectively on said cross-linked first organic layer, said deposited third organic
15 solution not deposited in any pockets containing said second organic solution; and

 cross-linking said third organic solution such that the third organic layer formed therefrom becomes insoluble.

20 38. A method according to claim 37 further comprising:
 masking said cross-linked second organic layer and said third organic layer to block the application of radiation in those regions where said second organic solution and said third organic solution have been deposited; and

depositing a fourth organic solution selectively into said
pockets on said cross-linked first organic layer, said deposited
fourth organic solution not deposited in any regions containing
said second organic solution or said third organic solution,
5 said deposited fourth organic solution capable of becoming a
fourth organic layer.

39. A method according to claim 38 further comprising:
cross-linking said fourth organic solution to form a fourth
10 organic layer therefrom.

40. A method according to claim 37 wherein said organic
device is a multi-color organic light emitting diode (OLED)
display.

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41. A method according to claim 40 wherein said first
organic layer is a conducting polymer layer.

42. A method according to claim 41 wherein said second
20 organic layer is a first color emissive layer, said first color
emissive layer emitting light of a first color upon charge
recombination.

43. A method according to claim 42 wherein said third organic layer is a second color emissive layer, said second color emissive layer emitting light of a second color upon charge recombination.

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44. A method according to claim 43 wherein said fourth organic layer is a third color emissive layer, said third color emissive layer emitting light of a third color upon charge recombination.

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45. A method according to claim 44 wherein said first color is red, said second color is green and said third color is blue.